

### REMARKS

Applicants respectfully request entry of the foregoing and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112, and in light of the remarks which follow.

Claims 11-14 and 17-18 are pending in the application, claims 1-10 and 15-16 having been canceled above, without prejudice or disclaimer of the subject matter therein, and claims 17-18 having been added above.

By the above amendments, claims 1-10 and 15-16 are canceled for being directed to non-elected subject matter. Claim 11 is amended by replacing the words "characterized in that it comprises" with --comprising--. Claim 11 is further amended by replacing the empirical formula to address the § 112 issue raised with respect to the original formula. Similar amendments are made to claims 12 and 14. Claim 11 is further amended by deleting the word "preferably" before the word "known" and by deleting "advantageously from 0.5 to 2.5, preferably from 1 to 2." Claim 12 is amended by deleting the words "characterized in that" and adding --wherein the composition--. In addition, the word "advantageously" is deleted before the words "in situ." Claim 12 is further amended by deleting "advantageously chosen from [lacuna]," and adding the words "selected from the group consisting" and "rare." Claim 12 is further amended by adding the words --and, wherein  $\mu$  represents the charge of the cation M, wherein Y is a monovalent anion or a monovalent anionic functional group, and wherein  $\xi$  is an anion or anionic functional group carried by a perhalogenated atom-- after the word "lead." Claim 13 is further amended by adding the words --selected from the group consisting of rare earth metals, gallium, germanium, arsenic, indium, tin, antimony, thallium, lead, and bismuth--. Claim 14 is

further amended by deleting the word "preferably" before the word "known" and by editing the last line of the claim to read, in part, "where Q is one or two." Finally, new claims 17 and 18 are added to define exemplary embodiments of the invention. Support for new claims 17 and 18 can be found at least at the original version of claim 11.

Applicants thank the Examiner for acknowledging the Information Disclosure Statement filed on July 23, 2002, and the Preliminary Amendment filed on November 25, 2003.

Turning now to the Official Action, Applicants hereby acknowledge their election of Group I (claims 11 and 12, directed to a catalytic composition comprising one or more compounds corresponding to the specified empirical formula). As the Examiner has now also examined claims 13 and 14, Applicants understand that, upon further consideration, the Examiner chose to include claims 13 and 14, originally included in Group IV, in Group I because the subject matter of these claims falls within the same general class. Applicants thank the Examiner for examining these additional claims.

The Official Action indicates that the Oath or Declaration is defective. In particular, the Official Action indicates that the Oath or Declaration is defective because it was not executed by inventor Peyronneau. For at least the reasons that follow, Applicants respectfully request reconsideration and withdrawal of the objection.

In particular, upon reviewing the contents of Applicants' file for the instant application, Applicants discovered a copy of the combined Declaration and Power of Attorney signed by Magali Peyronneau on December 11, 2001. Applicants believe

that a copy of the signed Declaration was filed in response to the Notice to File Missing Parts on January 24, 2002. For the Examiner's convenience, Applicants provide a copy of the executed Declaration.

Accordingly, in view of the attached executed Declaration, Applicants respectfully request reconsideration and withdrawal of the objection.

The specification also stands objected to for including informalities. First, with respect to the headings in the Tables at the end of the specification, Applicants have amended Tables to include headings. Concerning the informality on page 34, Applicants have reviewed page 34 but are unable to find the identified informality.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the objection.

The Abstract of the Disclosure stands objected to for providing variables. In order to obviate the objection, Applicants have provided the attached Substitute Abstract.

Accordingly, Applicants request reconsideration and withdrawal of the objection.

Claims 11-14 stand rejected under 37 U.S.C. §112, second paragraph, as being indefinite. For at least the reasons that follow, withdrawal of the rejection is in order.

First, concerning the rejection of claims 11, 13 and 14, for failing to provide an appropriate chemical structure, Applicants have amended the claims to obviate the rejection. In particular, Applicants have amended the sulfonate group to read "-SO<sub>3</sub>", as suggested by the Examiner. Since this amendment does not narrow the scope of

the claims, Applicants submit that claims 11, 13 and 14 should be accorded their full range of equivalents.

Concerning the rejection of claim 11, but not defining X, Applicants submit that the variable  $R_x$  is defined as a radical in which the carbon curing the sulfonic group is perhalogenated.

With respect to the rejection of claim 11 for including the language "for giving Lewis acids," Applicants submit that MPEP §2173.05(g) states that there is nothing inherently wrong with defining some part of an invention in functional terms. Moreover, it has been decided that functional language, in and of itself, render a claim improper. See In re Swinehart, 439 F.2d, 210, 169 USPQ 226 (CCPA 1971). Applicants submit that the phrase "known for giving Lewis acids" is an acceptable functional claim element because it sets definite boundaries on the patent protection sought. See In re Barr, 444 F.2d. 588, 170 USPQ 33 (CCPA 1971). However, to provide further clarity, Applicants have deleted the word "preferably" preceding the functional language.

Concerning the lack of antecedent basis for "the carbon carrying the sulfonic functional group," Applicants have further amended claim 11 by replacing "the" with --a-- before the word "carbon."

Also, with respect to the rejection of claim 11 for including the words "preferably" and "advantageously" and for providing narrower ranges within the same claim, Applicants deleted the words "...advantageously from 0.5 to 2.5, preferably from 1 to 2," to obviate the rejection.

Concerning the question about the use of the term "at least trivalent" with respect to element M, Applicants submit that this phrase is intended to mean that

element M is at least trivalent but could also, for example, be tetravalent, pentavalent, hexavalent, etc.

Concerning the rejection of claim 12 for failing to define variables Y,  $\mu$ , and zeta, Applicants have amended the claim by adding the words "...and, wherein  $\mu$  represents the charge of the cation M, wherein Y is a monovalent anion or a monovalent anionic functional group; and wherein  $\xi$  is an anion or an anionic functional group carried by a perhalogenated atom."

Concerning the rejection of claim 12 for the use of "[lacuna]," Applicants have replaced the word with --rare--, as suggested by the Examiner.

Concerning the rejection of claim for use of "advantageously in situ" and "advantageously chosen from," Applicants have deleted these phrases from the claim to obviate the rejection.

Concerning the rejection of claim 12 for the reference to  $MY_\mu$  as a salt, Applicants submit that on one hand M is defined as a metal trivalent in cationic form (see, for example, page 13, last line) and, on the other hand, Y is an anion.

With respect to the rejection of claim 13 for use of "at least trivalent cationic form, Applicants again submit that this phrase is intended to indicate that the element M can be trivalent, tetravalent, pentavalent, hexavalent, etc.

With respect to the recitation concerning element M being "an element," Applicants have further amended claim 13 to recite that "M is an element in at least trivalent cationic form selected from the group consisting of rare earth metals, gallium, germanium, arsenic, indium, tin, antimony, thallium, lead and bismuth." Support for this amendment can be found at least in claim 12.

Concerning the antecedent basis issue with respect to "the anion or anions" Applicants have replaced "the" with --an--.

To obviate the rejection concerning the antecedent basis issue with "the carbon carrying said sulfonate functional group, Applicants have added the words --where R<sub>x</sub> is a radical in which a carbon carrying the sulfonic group is perhalogenated--.

Concerning the rejection of claim 14 for the language defining element q, Applicants have amended the claim, as suggested by the Examiner, to read, in part, "... 1 or 2."

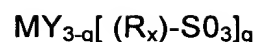
Finally, concerning the rejection for use of the phrase "preferably known for giving Lewis acids," Applicants have again deleted the word "preferably." Concerning the remaining functional language, Applicants again submit that the use of functional language is not per se improper. See MPEP §2173.05.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the Section 112, second paragraph rejections.

Claims 11 to 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Singh, Indian J. Chem. Vol. 22A, pp. 814-815, Kawada et al. J. Chem. Soc. Chem. Commun., pp. 1157-1158, Desmures et al., Tetrahedron Letts., Vol. 51, pp. 8871-8874 (Desmures I), and Desmures French Patent 2,756,279 (Desmures II).

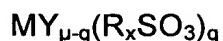
For at least the reasons that follow, withdrawal of the rejection is in order.

Claim 11, as amended above, recites a catalytic composition comprising one or more compounds corresponding to one or more compounds corresponding to the empirical formula:



with M representing an at least trivalent element, known for giving Lewis acids, where  $Y^-$  is a monovalent anion or a monovalent anionic functional group and where  $R_x$  is a radical in which a carbon carrying the sulfonic functional group is perhalogenated and where q is between 0.1 and 2.9 inclusive.

Claim 13, as amended above, recites a compound of formula:



- where M is an element in an at least trivalent cationic form selected from the group consisting of rare earth metals, gallium, germanium, arsenic, indium, tin, antimony, thallium, lead and bismuth;
- where  $\mu$  represents the charge of the cation corresponding to M;
- where  $R_x$  is a radical in which a carbon carrying the sulfonic group is perhalogenated
- where  $Y^-$  represents an anion or anions, other than the sulfonates perhalogenated on the carbon carrying said sulfonate functional group;
- where q represents an integer chosen within the 5 closed range from 1 to  $\mu-1$ .

The Official Action asserts that Singh discloses the preparation of antimony tristrifluorosulfonate. The Official Action further asserts that Kawada has a similar disclosure for lanthanide tristrifluorosulfonates (Table II), Desmures I at page 8872, lines 304, and Desmures II at page 33. The Official Action admits that none of the references discloses a Group 3, 13, or lanthanide metal trifluorosulfonate with less

than three triflate ligands bonded to the metal. However, the Official Action asserts that since each of the primary references uses an excess of triflic acid to make their trisulfates, the routine in the art would have believed that a lower stoichiometric amount of triflic acid or its precursor would have led to a metal with a lower number of triflate ligands bonded to it. Thus, the Official Action concludes that it would have been obvious to one of ordinary skill in the art to apply that skill to the disclosure of the primary references with a reasonable expectation of obtaining a highly-useful Group 3, 13 or lanthanide metal triflate with less than tris coordination of triflate anions to the metal that would still function as a Friedel Crafts catalyst due to its high Lewis acidity (See Official Action at p. 7).

Applicants submit that the claimed composition would not have been obvious over the above-asserted combination of references because the asserted combination does not consider the invention as a whole. Specifically, Applicants do not agree with the assertion that the use of metals with less than 3 triflate ligands is obvious in view of the existence of metals liganded purely by triflate. In particular, it is well-known that the ligand has a strong influence on the strength of Lewis acids. Applicants have discovered that when changing the partiality of ligands, one can obtain a property very similar to that obtained with a pure ligand. See, for example, the comparison in Example 5, where you have six triflic acids for one  $\text{Yb}_2\text{O}_3$  (first line of the Table) and when you have four triflic acids for one  $\text{Yb}_2\text{O}_3$ . It is clear that the yield is very similar in both cases and that the stoichiometry of triflic acid is not needed. This is an important discovery because in such catalysts, what is expensive is not the metal but the triflic radical. Thus, Applicants have discovered that they can solve this important demand by diminishing the price of these catalysts without



diminishing their efficiency. Certainly, none of the cited references, alone or in combination, disclose or suggest achieving this advantage.

For at least the above reasons, Applicants respectfully submit that the catalytic composition of claims 11 and 12 and the compound of claims 13 and 14 would not have been obvious over the above-asserted combination of references. Applicants respectfully request reconsideration and withdrawal of the §103(a) rejection.

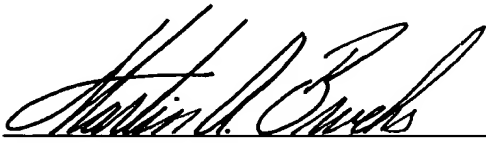
From the foregoing, Applicants earnestly solicit further and favorable action in the form of a Notice of Allowance.

If there are any questions concerning this paper or the application in general, Applicants invite the Examiner to telephone the undersigned at the Examiner's earliest convenience.

Respectfully submitted,

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December 11, 2001.